

# UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 2519

CSAH NO. 22

OVER THE

RUM RIVER

DISTRICT 5 - ANOKA COUNTY

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PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY  
COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 104)

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 2519, Piers 1 and 2, were found to be generally in good condition below water with no defects of structural significance observed. Minor scaling and footing exposure was observed at both piers. The channel bottom around the substructure units presently appears stable with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

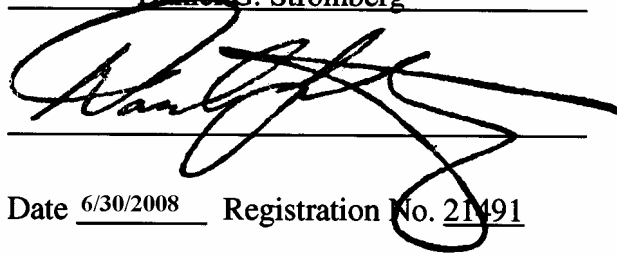
- (A) The top of the footing at each pier was exposed. At Pier 1, the footing was exposed along the east face 1.9 feet below the waterline, with no vertical exposure detected. At Pier 2, the footing exposure extended 4.2 feet below the waterline, around the upstream nose, and along the east and west faces from the upstream nose to the downstream 1/4 point with no vertical exposure.
- (B) A band of light scaling was observed around both piers from 1 foot above to 6 inches below the waterline, with typical penetrations of 1/16 inch and a maximum penetration of 1/8 inch.
- (C) A moderate accumulation of 8-inch-diameter and smaller timber debris was observed at the upstream nose of Pier 2 extending from the channel bottom up 3 feet. The timber debris is in addition to a 20-foot-long by 2-foot-diameter log along the east face on the channel bottom.

RECOMMENDATIONS:

- (A) Monitor the footing exposures and timber drift accumulation during future inspections. If the drift is found to be increasing, removal may be warranted at that time.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Daniel G. Stromberg  
Registered Professional  
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 2519

Feature Crossed: Rum River

Feature Carried: CSAH No. 22

Location: District 5 - Anoka County

Bridge Description: The superstructure consists of a three span, multiple concrete beam structure. The superstructure is supported by two concrete abutments and two concrete hammerhead piers, numbered 1 and 2 starting from the west. The substructure units are all founded on steel H-piles.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 14, 2007

Weather Conditions: Partly Cloudy, 68 °F

Underwater Visibility: 1.0 Foot

Waterway Velocity: 2.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: The piers are each of concrete hammerhead design with an oblong rectangular shaft having rounded noses, supported by a rectangular footing also with round noses and founded on steel H-piles.

Maximum Water Depth at Substructure Inspected: Approximately 4.2 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 1.

Water Surface: The waterline was approximately 13.4 feet below reference.

Waterline Elevation = 446.3

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code J/91

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

       Yes   X   No



Photograph 1. View of Downstream Channel, Looking South.



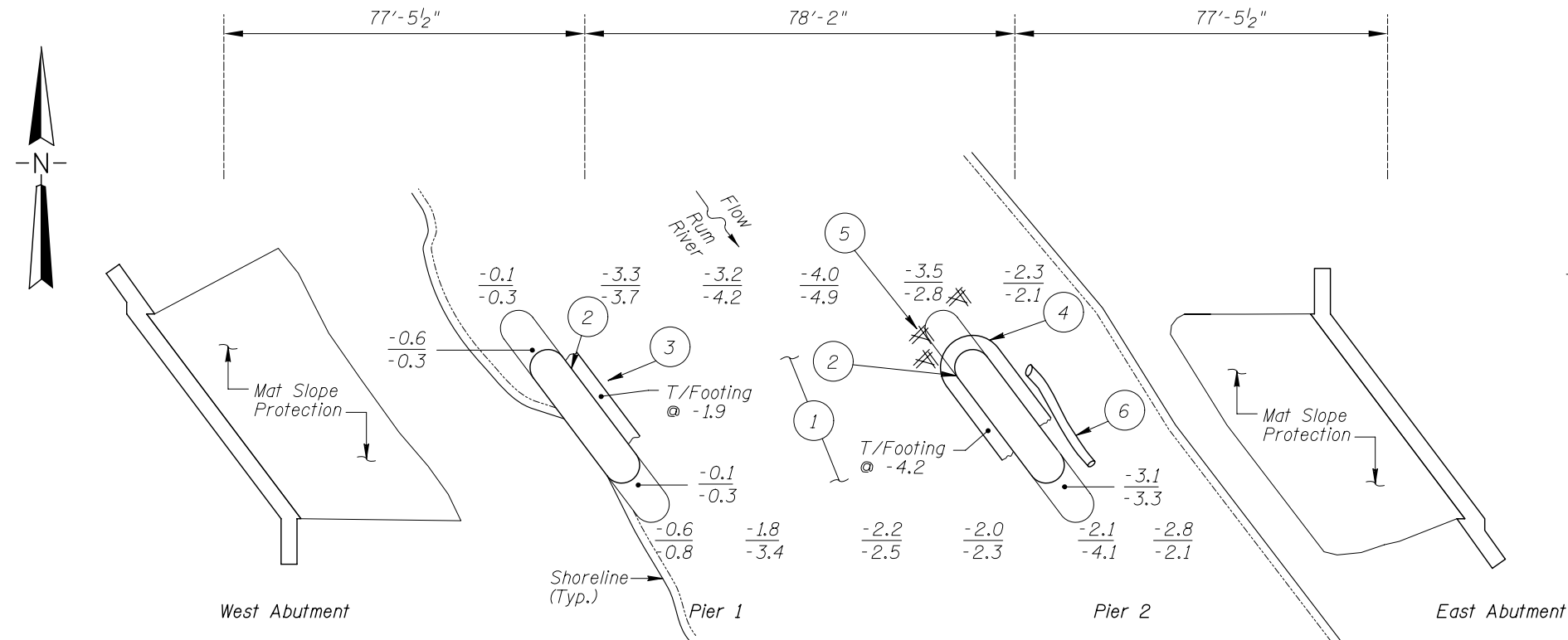
Photograph 2. View of Pier 1, Looking Northeast.



Photograph 3. View of Pier 2, Looking East.



Photograph 4. View of West Abutment, Looking Southwest.



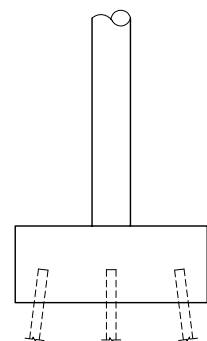
SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on August 14, 2007, the waterline was located approximately 13.4 feet below the top of the pier cap at the downstream end of Pier 1. This corresponds to a waterline elevation of 446.3.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

1. The channel bottom material consisted of sand with scattered 2 to 12 inch cobbles.
2. A band of light scaling was observed from 1 foot above to 6 inches below the waterline around both piers with typical penetrations of 1/16 inch and maximum penetrations of 1/8 inch. Above and below the band of scaling the concrete was smooth and sound.
3. The top of the footing was exposed at 1.9 feet below the waterline along the east face of Pier 1 from upstream quarter point to downstream quarter point with no vertical exposure observed.
4. The top of the footing was exposed at 4.2 feet below the waterline, around the upstream nose, and along the east and west faces from the upstream nose to the downstream quarter point, with no vertical exposure.
5. A moderate accumulation of timber debris was observed at the upstream nose of Pier 2, consisting of 8 inch diameter and smaller branches extending from the channel bottom up 3 feet and 8 feet long (East-West) by 3 feet wide (North-South).
6. A 20-foot-long by 2-foot-diameter log was observed along the east face of Pier 2 on the channel bottom.



TYPICAL END VIEW OF PIERS

Legend

-2.0	Sounding Depth (8/14/07)
-2.5	Sounding Depth (9/24/02)

Note:

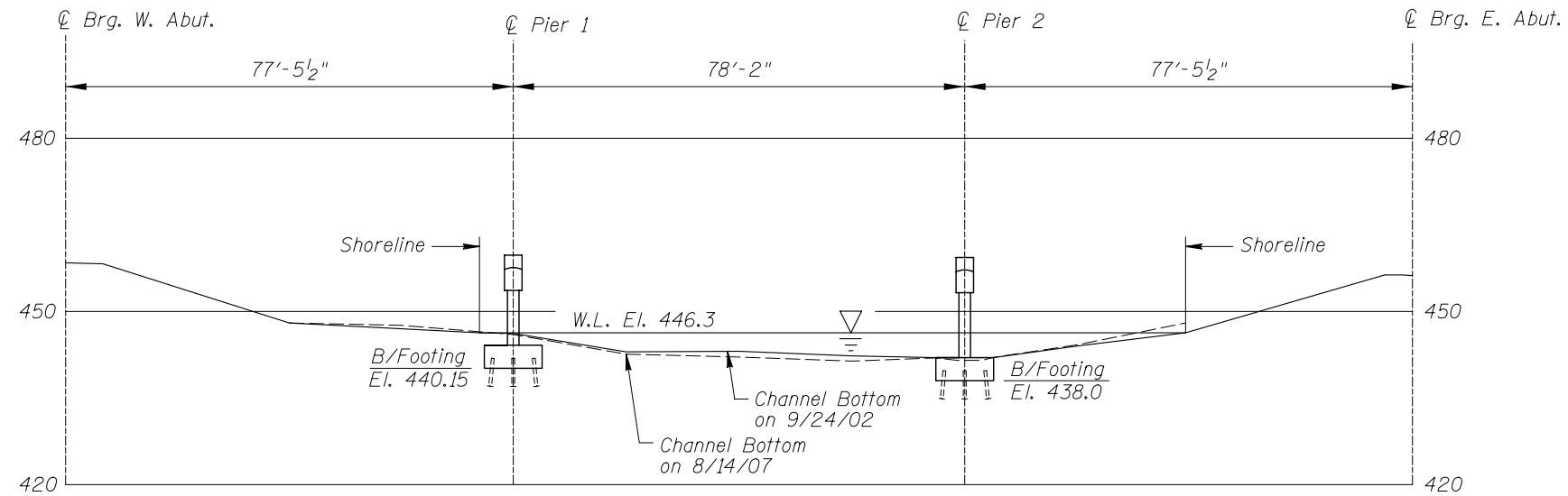
All soundings based on 2007 waterline location.

**MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION**

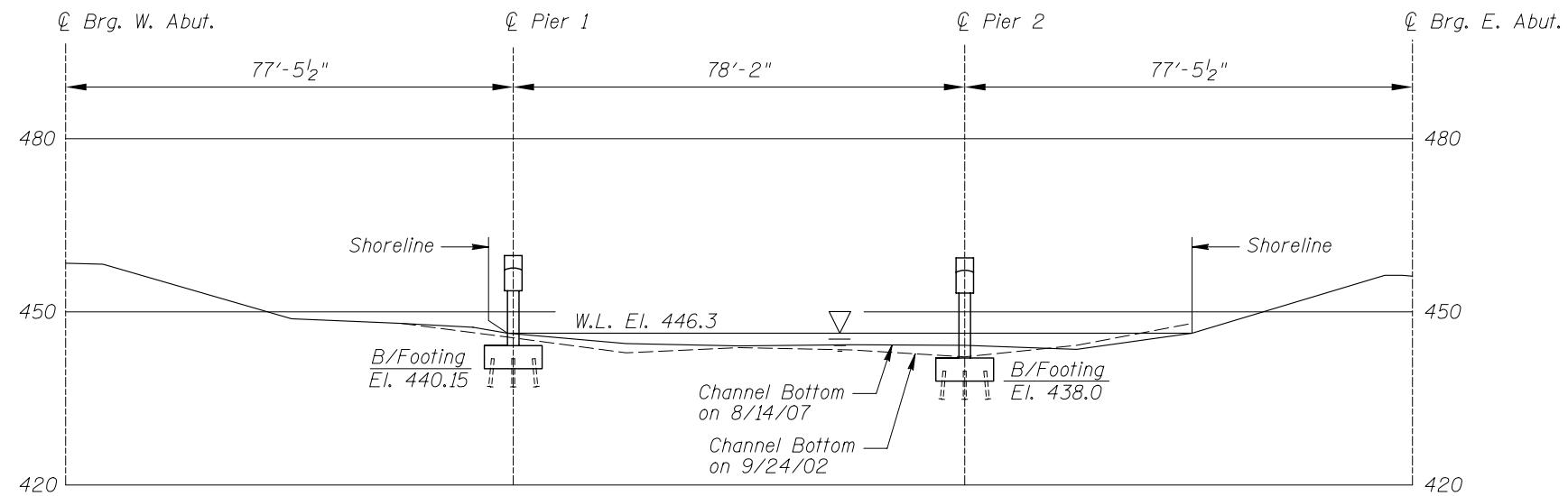
STRUCTURE NO. 02519  
OVER THE RUM RIVER  
DISTRICT 5, ANOKA COUNTY

**INSPECTION AND SOUNDING PLAN**

Drawn By: PRH	<b>COLLINS ENGINEERS</b>	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: VR			Scale: NTS
Code: 52210104			Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:  
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION			
STRUCTURE NO. 02519 OVER THE RUM RIVER DISTRICT 5, ANOKA COUNTY UPSTREAM AND DOWNSTREAM FASCIA PROFILES			
Drawn By: PRH	<b>COLLINS</b> ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUGUST, 2007	
Checked By: VR		Scale: 1"=30'	
Code: 52210104		Figure No.: 2	

MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES  
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 14, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 2519 WEATHER: Partly Cloudy, 68 °F

WATERWAY CROSSED: Rum River

DIVING OPERATION: X SCUBA        SURFACE SUPPLIED AIR  
       OTHER       

PERSONNEL: John J. Loftus, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 8:42 A.M.

TIME OUT OF WATER: 9:12 A.M.

WATERWAY DATA: VELOCITY 2.0 f.p.s.

VISIBILITY 1.0 foot

DEPTH 4.2 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete was in good condition with no defects of structural significance below water. Each of the piers exhibited minor footing exposure (top of footing only). A moderate accumulation of timber debris was observed at the upstream nose of Pier 2, as well as a 20-foot-long by 2-foot-diameter log along the east face of the pier. The channel bottom appeared stable with no appreciable changes since the previous inspection.

FURTHER ACTION NEEDED:        YES X(\*) NO

\* Consideration can be given to removal of the timber debris accumulated around Pier 2 during normal maintenance operations, especially if it is found to be increasing in the future.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 2519  
INSPECTORS Collins Engineers, Inc.  
ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.  
WATERWAY CROSSED Rum River

INSPECTION DATE August 14, 2007  
NOTE: USE ALL APPLICABLE CONDITION  
DEFINITIONS AS DEFINED IN THE MINNESOTA  
RECORDING AND CODING GUIDE INCLUDING  
GENERAL, SUBSTRUCTURE, CHANNEL AND  
PROTECTION, AND CULVERTS AND WALL  
DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	1.9'	N	7	7	9	N	7	6	7	7	8	7	7	N	N	N	N	N
	Pier 2	4.2'	N	7	7	9	N	7	6	7	7	6	6	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good condition with no defects of structural significance below water. Each of the piers exhibited minor footing exposure (top of footing only). A moderate accumulation of timber debris was observed at the upstream nose of Pier 2, as well as a 20-foot-long by 2-foot-diameter log along the east face of the pier. The channel bottom appeared stable with no appreciable changes since the previous inspection.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.  
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.